

CLAIMS

We claim:

1. An apparatus for dispensing medication comprising:
  - at least one canister containing the medication to be dispensed, said canister being movable in a first and a second direction;
  - a mouthpiece providing a point of dispensation for the medication from the canister to a user when the canister is moved in the first direction;
  - a switch means for completing an electrical circuit when said canister moves in said first direction and opening the electrical circuit when said canister moves in the second direction, wherein the switch means is oriented to enable operational connectivity with the canister or canister discharge;
  - a counter module for performing a count upon the closure of the electrical circuit and displaying a dispensation history of the medication in the at least one canister; and
  - a seal isolating the counter module from the mouthpiece and the canister to prevent contamination.
2. The apparatus as recited in claim 1, wherein the dispensation history includes the number of doses of medication remaining in the canister.
3. The apparatus as recited in claim 1, wherein the dispensation history includes the number of doses taken of a dosage sequence.
4. The apparatus as recited in claim 1, wherein the dispensation history includes the number of doses taken over a period of time.
5. The apparatus of claim 4, wherein the period of time can be varied by a user.

6. The apparatus of claim 1, wherein the dispensation history includes time since the last dispensation of the medication.
7. The apparatus as recited in claim 1, wherein a display portion of the counter module is on the front of the mouthpiece.
8. The apparatus as recited in claim 1, wherein a display portion of the counter module is on the back of the mouthpiece.
9. The apparatus as recited in claim 1, wherein the display portion of the counter module is on the side of the mouthpiece.
10. The apparatus of claim 1, wherein the switch means includes an electrically conductive contact imbedded in the seal.
11. The apparatus of claim 1, wherein at least portion of the counter module is disposed in the mouthpiece.
12. The apparatus of claim 1, wherein at least a portion of the counter module is disposed external to the mouthpiece.
13. The apparatus of claim 1, wherein the seal includes a ramp that acts upon the switch means when the canister is moved in the first direction.
14. The apparatus of claim 1, wherein the switch means is mounted on a circuit board and is acted upon by a ferrule portion of the canister, the switch means being isolated from the canister by a second seal.
15. The apparatus of claim 1, wherein the seal is made of conductive material.
16. The apparatus of claim 1, wherein the switch means is a water resistant dome switch.
17. The apparatus of claim 16, wherein the dome switch is mounted substantially parallel to an axis of travel of the canister and is acted upon by a ferrule of the canister.

18. The apparatus of claim 16, wherein the dome switch is mounted on a platform that extends perpendicular to the axis of travel of the canister into the mouthpiece and is acted upon by an end portion of the canister.
19. The apparatus of claim 16, wherein the dome switch is mounted on a top surface of an actuator sump and is acted upon by an end portion of the canister.
20. The apparatus of claim 16, wherein the switch means is comprised of:
  - at least two open contacts that are in electrical communication with the counter module; and
  - a conductive surface of the canister to close the contacts when the canister moves in the first direction.
21. The apparatus of claim 20, where in the at least two open contacts are located on a top surface of an actuator sump and are acted upon by a metallic end portion of the canister.
22. The apparatus of claim 16, wherein the dome switch is located an actuator sump and is acted upon by the actuator as the canister moves in the first direction.
23. The apparatus of claim 16, wherein the dome switch is located on an exterior surface of the mouthpiece and is depressed when the user depresses the canister against the mouthpiece to move the canister in the first direction.
24. The apparatus of claim 1, wherein the switch means is formed of a movement sensor.
25. The apparatus of claim 24, wherein the movement sensor is a light sensor, said light sensor emitting light and receiving a reflected signal, upon movement of the canister the reflected signal is altered and the altered signal is detected by the sensor providing input to the circuitry and changes the count.
26. The apparatus of claim 25, wherein the sensor is located to act upon and detect a changing position of the canister as it is moved in the first direction.

27. The apparatus of claim 24, wherein the movement sensor is an acoustic sensor, said acoustic sensor emitting an acoustic signal and receiving a reflected signal, upon movement of the canister the reflected signal is altered, and the altered signal is detected by the sensor closing contacts housed therein.
28. The apparatus of claim 24, wherein the movement sensor is an acoustic sensor, said acoustic sensor senses the acoustic signature of the aerosolization of a metered dose dispensation.
29. The apparatus of claim 27, wherein the sensor is located to act upon and detect a changing position of the canister as it is moved in the first direction.
30. The apparatus of claim 24, wherein the movement sensor is a magnet sensor, upon movement of the canister the magnetic signature of the canister is altered which is detected by the sensor providing input to the circuitry and changes the count.
31. The apparatus of claim 30, wherein the sensor is located to act upon and detect a changing geometry of the canister as it is moved in the first direction.
32. The apparatus of claim 24, wherein the sensor is a pressure sensor.
33. The apparatus of claim 32, wherein the pressure sensor is located in an actuator sump and detects a change in pressure upon the dispensation of the medication from the canister.

34. An apparatus for dispensing medication comprising:
- at least one canister containing the medication to be dispensed, said canister being movable in a first and a second direction;
  - a switch means for completing an electrical circuit when said canister moves in said first direction and opening the electrical circuit when said canister moves in the second direction;
  - a counter module for performing a count upon the closure of the electrical circuit and displaying a dispensation history of the medication in the at least one canister; and
  - a ramp seal isolating the switch means from the canister to prevent contamination, wherein the ramp seal is acted upon by the canister upon movement of the canister in the first direction and wherein the ramp seal acts on the switch means to close the electrical circuit.
35. The apparatus as recited in claim 34, wherein the dispensation history includes the number of doses of medication remaining in the canister.
36. The apparatus as recited in claim 34, wherein the dispensation history includes the number of doses taken of a dosage sequence.
37. The apparatus as recited in claim 34, wherein the dispensation history includes the number of doses taken over a period of time.
38. The apparatus of claim 37, wherein the period of time can be varied by a user.
39. The apparatus of claim 34, wherein the dispensation history includes time since the last dispensation of the medication.
40. The apparatus as recited in claim 34, wherein a display portion of the counter module is on the front of the mouthpiece.

41. The apparatus as recited in claim 34, wherein a display portion of the counter module is on the back of the mouthpiece.
42. The apparatus as recited in claim 34, wherein the display portion of the counter module is on the side of the mouthpiece.
43. The apparatus of claim 34, wherein the switch means includes an electrically conductive contact imbedded in the seal.
44. The apparatus of claim 34 wherein a ferrule portion of the canister acts upon the ramp seal.
45. The apparatus of claim 34, wherein the counter, and ramp seal are formed in a common component.
46. The apparatus of claim 34 further comprising a sump for a nozzle of the canister wherein said counter, ramp seal and sump are formed as a common component.
47. The apparatus as recited in claim 45 wherein the common component is injection moldable.
48. The apparatus as recited in claim 46 wherein the common component is injection moldable.
49. The apparatus as recited in claim 45 wherein the common component is adaptable to canister holders for a variety of canister shapes and sizes.
50. The apparatus as recited in claim 46 wherein the common component is adaptable to canister holders for a variety canister of shapes and sizes.
51. The apparatus of claim 34 wherein the counter is adaptable to canister holders for a variety of canister shapes and sizes.
52. The apparatus of claim 34 formed of components including a canister holder, a canister, a mouthpiece, and a counter, wherein the counter is adaptable for use with a canister holder, canister, and a mouthpiece of a variety of sizes and shapes.

53. The apparatus of claim 1 wherein the counter module is adaptable to canister holders for a variety of canister shapes and sizes.
54. The apparatus of claim 1 formed of components including a canister holder, a canister, a mouthpiece, and a counter, wherein the counter is adaptable for use with a canister holder, canister, and a mouthpiece of a variety of sizes and shapes.